infection control and community education.

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Institutional Chickenpox Prevention Programme (ICPP) in a tertiary care hospital in Singapore: Lessons from epidemiology and contact tracing

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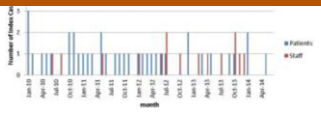
Background: Chickenpox vaccination in Singapore is not mandatory. At the National University Hospital (NUH), nosocomial transmission has led to a sentinel event and secondary cases. To prevent future transmissions, we studied the impact of Institutional Chickenpox Prevention Program at NUH.

Methods & Materials: NUH is a 1000 bedded tertiary care hospital in Singapore, with negative pressure isolation capability in 179 rooms and staff strength of approximately 7300. A retrospective audit of contact tracing data was done from January 2010 to June 2014, with probabilistic modeling to predict costs and number of future varicella infections. Data was obtained from clinical records, hospital information systems and the human resource department.

Results: There were 51 cases of chickenpox including 15 staff (Average 11.3 cases per year in total, 3.3 per year among staff). One index resulted in secondary transmission. The median number of staff contacts per index case was 4 (IQR 2- 13) with 0 (IQR 0-2) being non-immune staff contacts . Direct costs and man hours lost in high risk areas (obstetrics and oncology), were significantly higher.

Current vaccination strategy A, where staff with negative or uncertain history of prior chickenpox, are screened with serum *Varicella zoster* virus immunoglobulin (VZV IgG) levels was compared with two scenarios B and C using probabilistic modeling, (B: VZV IgG for all existing and new staff; C: VZV IgG for existing staff with negative history and all new staff). After 10 years, expected number of chickenpox infections per year are 3, 1, and 2 under Strategies A, B and C respectively. Number of susceptible healthcare workers is 744.6 for A, 109.5 for B and 355.5 for C. Cumulative costs for Strategies B (599048 SGD) and C (496752 SGD) are 65% and 37% higher as compared to Strategy A.



Conclusion: Chickenpox adds significant burden in terms of costs and man hours lost. Current strategy relies on history and contact tracing, to keep the number of infections at 3 per year. Wider screening strategies incur greater cost, but targeted interventions such as laboratory screening for international staff and those working in high risk wards may be more cost effective.

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Cultural rationale and architectural designs of Isolation Centres (ICs): A case of dangerous pathogens such as Ebola

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Background: Socio-cultural and Architectural suitability of a medical facility are very key to infection prevention and control. ICs should accommodate the well-being of the users. From the recent Ebola outbreak in West Africa, culture played a significant role to the spread of the disease. ICs should be designed cognisant of the risks of spread of disease such as Ebola through socio-cultural practices and also architectural unsuitability. Therefore the space designed for this function should be well thought through to achieve the two contradictory statements. When ICs are poorly designed, they may cause more harm than good because they may lead to infection of even the medical workers and surrounding communities.They are also completely useless and a complete waste of the resources. The objectives of the study are; - 1. To examine the socio-cultural and architectural suitability of ICs. 2. To design ICs that are socio-cultural and architecturally suitable. 3. To establish factors that hinder socio-cultural and architectural suitability.

Methods & Materials: The research covered the ICs at Entebbe the country's main entry point and Kampala the country's capital city, Uganda. This is because infectious diseases normally spread from country to country and also we have seen the impact of such infection on capital cities unlike the usual that is normally in rural areas. I carried out interviews and discussions with key persons. I did desk study of the drawings, I physically visited the centres and also took part in VHF and EDPs trainings.

Results: The existing isolation centres and medical facilities are not socio-culturally and architecturally adequate thus a risk to infection prevention and control. They are also unfriendly to the users thus resistances for staff and also for patients to be taken there.

Conclusion: There is need for a socio-culturally and architecturally suitable IC at the country's main international access point and the capital city. Infectious disease units should be created in all national hospitals and should be well designed. I made designed

for both permanent and temporally ICs that are socio-cultural and architecturally suitable.

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Modifying the existing water tap system to create a no touch, cost effective solution

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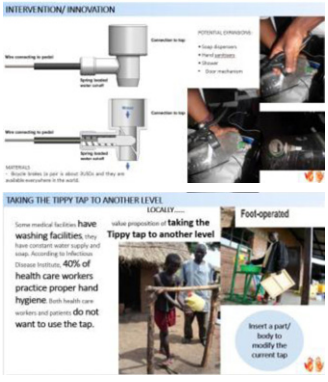
Background: Infection prevention and control is very key in health care. with the main component being the hand hygiene. Mid-1800s Ignax P. Semmelweis established that hospital-acquired infections (HAI) were transmitted via health care workers' (HCW) hands. . ...Contaminated HCW's hands are the commonest route of HAI transmission. Nosocomial spread (patient to health care worker) in the health care setting is key in amplifying the infectious diseases outbreaks. Research shows that a hospital has a lot of infections, hand hygiene contributes about 60% reduction in infection spread. The most effective and cost efficient way to prevent the spread of germs/infections is by using soap and water. From my analysis, hand hygiene facilities like sinks and sanitisers placed all over the hospitals have been about 40% successful since people fear to get infections from them through touch.

Methods & Materials: I took a case of referal hospitals in Kampala, Uganda and health centre IVs including the national referral hospital. I physically visited the centres and had intervies and discusions with the key personss including persons from ministry of health.

Results: Some medical facilities have washing facilities, they have constant water supply and soap. According to Infectious Disease Institute, 40% of health care workers practice proper hand hygiene. Both health care workers and patients do not want to use the tap. Research has been done and solutions put in place but they are very expensive thus ineffective in low and medium income countries. These include sensors-we have tried to adopt but the initial cost and maintenance has proved expensive. Also use of tissue is highly costly and medical personnel tend to forget using it. Even the routine rinsing of the tap after use can easily be forgotten.



Conclusion: **No hand contact** - Only contact with device is through a foot-pedal, no fear of infection, reducing the possibility of human error

Lower water consumption - water only runs when the pedal is pressed

Cheap - US$3 Purchase price, low production cost, lower maintenance cost and no external power required

No extra installation costs - no cost of demolishing and creating a completely new system, universal fitting

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Investigation of an outbreak due to Serratia marcescens in a neonatal intensive care unit in a tertiary care hospital

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Background: *Serratia marcescens* (*S. marcescens*) is an accepted clinical pathogen, particularly in high risk settings. Numerous outbreaks have been noted particularly as bloodstream infections in NICU. It is difficult to treat because of the resistance to antibiotics including beta-lactams and aminoglycosides. We describe the epidemiological features of *S. marcescens* infection outbreak in a 20 bedded tertiary care NICU.

Methods & Materials: In April, 2015 we had a low birth weight baby with septicaemia due to *S. marcescens*. It was sensitive to all antibiotics except colistin and polymixin B. The baby received cefotaxime and gentamicin but died. After a week, within a period of 9 days 6 neonates, admitted due to other reasons [3 with hypoxic ischemic encephalopathy, 2 with very low birth weight (VLBW), 1 with meconium aspiration syndrome] were having *S. marcescens* sepsis. The organism was diagnosed by blood culture in Bactec 9050 system with standard protocol and sensitivity was performed according to CLSI guidelines. Promptly several environmental samples, hand swabs, iv fluid samples and rectal and oral swabs of other neonates were processed. Affected neonates were isolated and dedicated nursing staffs were allotted for them. Proper hand washing and diaper disposal were strictly emphasized.

Results: *S. marcescens* was obtained from a running IV fluid bottle of an unaffected neonate and from a normal saline bottle which was being used for reconstituting IV fluids for the neonates. Two VLBW neonates were found to be colonised with the same strain. One of them eventually developed sepsis with ventilator associated pneumonia with the same strain being isolated from blood and bronchoalveolar lavage fluid. No other samples revealed